

REMARKS

**1. Status of the claims**

With entry of this amendment, claims 1, 3, 6-8, 10-11, 14, 16-17 are amended and claims 21-24 are added. Claims 2, 5, 9, 12, 13, 15, 18 and 19 are canceled. Claims 1, 3-4, 6-8, 10-11, 14, 16-17 and 20-24 are pending with entry of the Amendment.

**2. Support for amendments to the claims**

Support for the amendments to the claims can be found throughout the specification, the drawings, and the claims as originally drafted. The amendment to claim 1 can be found on, e.g., page 4, line 23 and page 5, line 31 as well as the original claims as filed. The amendment to claim 14 finds support on, e.g., page 10, line 27 as well as the original claim as filed. No new matter is introduced.

**3. Objection to Specification**

The Examiner objected to the hyperlink in a paragraph of page 23 of the present application. As amended, the hyperlink is deleted. Accordingly, Applicants request withdrawal of the objection.

**4. Objection to the drawings by the draftsperson**

A copy of replacement drawing and a separate letter to the draftsperson are enclosed for the convenience of the Examiner.

**5. Rejections under 35 U.S.C. § 112, second paragraph**

The Examiner rejected that claims for recitation of a number of different words or phrases in the claims as filed. As amended, the claims either lack the rejected words or phrases or have been amended as suggested by the Examiner. Accordingly, Applicants request withdrawal of the rejections.

**6. *Rejection under 35 U.S.C. § 101***

The Examiner rejected claims 1-5, 7-10, 12-16 and 18-20 under 35 U.S.C. § 101 as allegedly not supported by a credible assertion of utility. Specifically, the Examiner argued that because the isolated rice sequence only has 20% identity with the Arabidopsis sequence, the Examiner raised doubts regarding the ability of the rice sequence to modulate flowering. The Examiner did not question that the Arabidopsis sequence is functional. The Examiner states on page 8 of the Office Action that the Applicants do not need to provide data verifying the same activity as the Arabidopsis sequence. However, it appears clear from the response that such evidence would overcome the rejection. Applicants provide such evidence in the accompanying declaration of Dr. Z.R. Sung, Ph.D. Accordingly, Applicants traverse the rejection.

The present application provides methods and compositions for modulating (i.e., increasing or decreasing) reproductive development including flowering time. *See, e.g.*, page 2, lines 24-26, page 14, lines 2-4 and page 18, lines 8-13 of the specification. Moreover, the application states that the recited gene, *OsEMF1*, is a rice homolog of the Arabidopsis *EMF1* gene and as such would be expected to function in a similar manner as the *EMF1*. *See, e.g.*, page 24, lines 14, referring to the *OsEMF1* gene as a "rice *EMF1* homolog." The application clearly sets forth the effects of modulating expression of *EMF1* in plants. *See, e.g.*, Example 3 on pages 25-26 of the application. Accordingly, one of skill reading the application would have understood that altering expression of *OsEMF1* would modulate reproductive development, including flowering time.

The Examiner acknowledges that altering reproductive development is a specific utility. *See*, bottom of page 8 of Office Action. However, the Examiner questioned whether *OsEMF1* actually affects such development. As demonstrated in the accompanying Declaration of Dr. Z.R. Sung, Ph.D., introduction of an *OSEMF1* polynucleotide to reduce endogenous expression using either sense or antisense constructs resulted in reduced flowering times and altered plant heights. These results closely parallel results previously observed for the Arabidopsis *EMF1* gene.

The results provided in the Declaration of Dr. Z.R. Sung, Ph.D. should remove any doubt that the recited sequences do indeed act in the way that is asserted in the patent application. Accordingly, Applicants respectfully request withdrawal of the rejection.

**7. *Rejection under 35 U.S.C. § 112, first paragraph: Enablement***

The Examiner rejected claims 1-5, 7-10, 12-16 and 18-20 as not enabled due to the utility rejection. As discussed above, the recited sequences do indeed have a specific and credible utility. Accordingly, Applicants respectfully request withdrawal of the rejection.

Moreover, the Examiner rejected the claims as not enabled for the full scope of the claims. Specifically, the Examiner argued that the specification provides no guidance for selection of proteins with the activity encoded by SEQ ID NO:1 and does not provide working examples demonstrating the sequences activity. Applicants respectfully traverse the rejection.

First, as demonstrated in the Declaration of Dr. Z.R. Sung, Ph.D., reduction of endogenous expression of OsEMF1 does modulate reproductive development, including flowering time in plants. Therefore, the absence of working examples in the application is irrelevant. Those of skill in the art at the time the application was filed were capable of modulating gene expression using sense and antisense constructs using routine methods as described in the application.

Second, as amended, the claims are directed to polynucleotides comprising at least 100 nucleotides of the coding sequence for a polypeptide at least 95% identical to SEQ ID NO:2. Applicants submit that at most only routine experimentation would be required to identify such closely related polypeptide sequences that modulate reproductive development. Moreover, the application provides guidance regarding what sequences are more or less likely to affect activity when changed. For example, lines 27-32 of page 24 of the specification describes conserved domains of the OsEMF1 and EMF sequences. Those of skill in the art would recognize that alterations in conserved

sequences are more likely to affect activity than changes in regions that are not conserved. In addition, those of skill in the art could readily align the two sequences to identify possible alterations that maintain activity. For example, alterations that introduce a particular nucleotide or amino acid in the EMF1 sequence into the corresponding position of the OsEMF1 sequence is not likely to affect activity. Accordingly, at most only routine experimentation is required to make and use the sequences recited in the present claims. Therefore, withdrawal of the rejection is respectfully requested.

**8. *Rejection under 35 U.S.C. § 112, first paragraph: Written Description***

The Examiner rejected the claims under 35 U.S.C. § 112, first paragraph as allegedly not meeting the written description requirement. Applicants respectfully traverse the rejection.

Applicants submit that the Federal Circuit has held that the written description requirement can be fulfilled in any number of ways, so long as the specification describes the invention “in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention.” *See University of California v. Eli Lilly & Co.*, 43 USPQ2d 1398, 1404 (Fed. Cir. 1997). For a chemical invention, an adequate description “requires a precise definition, such as by *structure*, formula, chemical name, or *physical properties*....” (Emphasis added). Accordingly, as described below, the present specification provides ample written description for the pending claims, precisely as required by the Court in *University of California*.

As amended, the claims are directed polynucleotides comprising at least 100 nucleotides of the coding sequence of a polypeptide at least 95% identical to SEQ ID NO:2. This claim language defines a *physical* and *structural property* of the invention, as explicitly required by the court in *University of California*. Percent identity to a particular sequence reflects the *structure* of the nucleic acid, *i.e.* that its primary *structure*, or nucleotide sequence, is similar to the recited sequence. Thus, the description of the claimed invention satisfies the written description requirement as set

forth by the court in *University of California* on at least two grounds, i.e. structure and physical properties.

Moreover, as discussed above, the application teaches that there are conserved domains, including a nuclear localization signal sequence, phosphorylation sites an ATP/GTP binding motif (p-loop) and a LXXLL motif. *See*, application on page 24, lines 27-30. Thus, in contrast to the Examiner's statement on page 10 of the Office Action, the application does provide a description of particular domains in the OsEMF1 polypeptide. Therefore, in view of the specification, those of skill in the art would have recognized that Applicants were in possession of the full scope of the claimed invention as of the filing date. Accordingly, Applicants respectfully request withdrawal of the rejection.

**8.     *Rejection under 35 U.S.C. § 102***

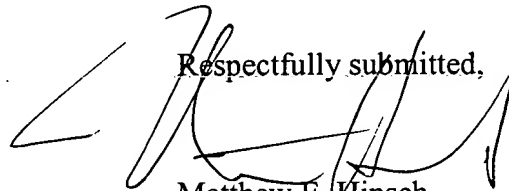
The Examiner rejected claims 1 and 2 as allegedly anticipated by Dorner *et al.* Specifically, the Examiner argued that the reference describes a polynucleotide that would hybridize to SEQ ID NO:1. Applicants respectfully note that there is no evidence or reason to believe that the sequences in Dorner would hybridize as the Examiner suggests. However, as amended, the claims do not include hybridization language. Therefore, Applicants request withdrawal of the rejection.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



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